DIGITALAGRI

MASTER ON DIGITAL TRANSFORMATION OF THE AGRI-FOOD & FORESTRY SECTOR

DIGITALAGRI MASTER'S DEGREE MODULES

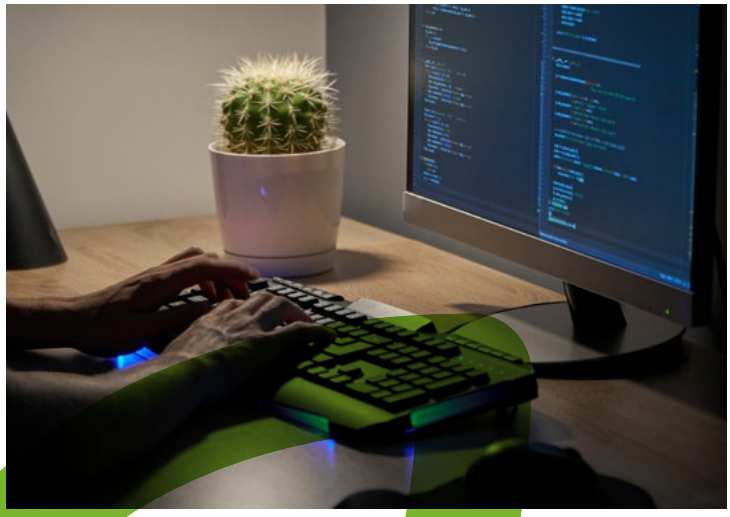
MODULE 1

INNOVATION PROCESSES AND DIGITALIZATION IN THE AGRIFOOD, FORESTRY AND RURAL DEVELOPMENT SECTOR.

Success stories. Technology watch and competitive intelligence systems. Practical cases of implementation of digitization processes: precision agriculture, precision livestock farming, agribusiness 4.0, precision forestry, rural development, earth and climate observation, sustainable water use. 6 ECTS

MODULE 2

CONCEPTS, TECHNIQUES AND TOOLS FOR DATA ANALYSIS.



Concepts, techniques and tools for data analysis. N-variate statistics, series analysis and methodologies for data exploration and filtering. Introduction to Python. Python applications to data analysis. Practical cases of data analysis in the field of Agricultural Engineering. Visualisation and communication of results. Tools for information visualisation: Google Data Studio. Dashboard design. 7 ECTS

MODULE 3

IOT IN THE AGRI-FOOD, FORESTRY AND RURAL DEVELOPMENT SECTORS. INDUSTRY 4.0

Development of IoT Systems: Hardware platforms for IoT. Sensors and actuators for the development of IoT systems. IoT communication networks and technologies. Tools for the Industrialization and deployment of IoT systems: Simulation platforms. Man-machine interface. Software technology for HMI development. Data management in IoT systems. SCADA development as HMI composition. IoT and Cloud Systems. 6 ECTS

MODULE 4

DATA PROCESSING AND BIG DATA ARCHITECTURE.

Concepts and tools for data pre-processing. Big Data architecture: introduction to relational and NoSQL databases. Introduction to Hive, MongoDB and Cassandra: installation, configuration and syntax. Understanding Hadoop ecosystem. Cloud services. 6 ECTS.

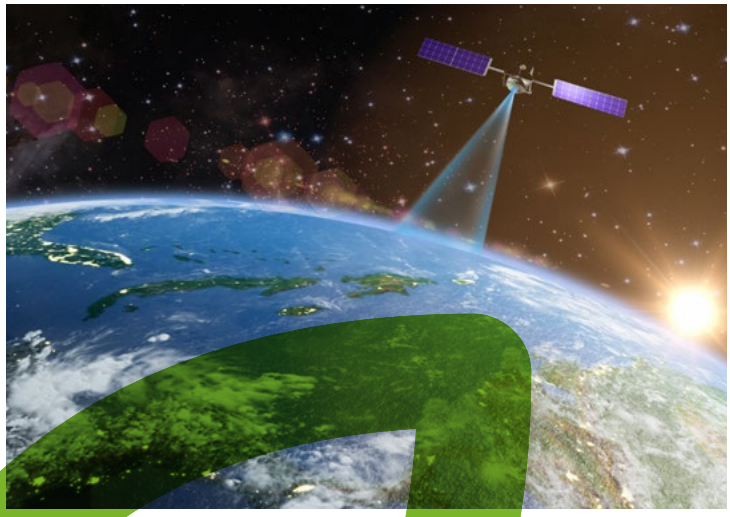
MODULE 5

CLOUD COMPUTING AND UTILITIES FOR THE AGRI-FOOD, FORESTRY AND RURAL DEVELOPMENT SECTOR.

Precision agriculture. GNSS technology applied to agricultural machinery. Correction signals. Fleet management of self-propelled agricultural machinery. AgGIS applications for precision agriculture. Prescription maps for fertilization with VRT machinery. Machinery for the application of phytosanitary products to olive groves based on nearby sensors. Traceability techniques applied to table olives. New technologies for passive and active prevention of accidents caused by agricultural machinery overturning. 6 ECTS

MODULE 6

REMOTE SENSING STRATEGIES.



Remote sensing, processing and analysis of satellite image time series by cloud computing services. Close remote sensing with UAVs, sensorisation strategies and spatial analysis. 6 ECTS

MODULE 7

PROXIMAL SENSING STRATEGIES.

Non destructive spectral sensors, NIR and hyperspectral devices, for assuring traceability and quality control in food products and processes. Multivariate processing of spectral data for the development and evaluation of quantitative and qualitative prediction models. Agrifood applications, networks and analytical services based on near-infrared spectral sensors. Use of sensors in agricultural applications. Use of sensors in precisión livestock farming. 6 ECTS

MODULE 8

BIG DATA ANALYTICS AND SUPERCOMPUTATION FOR THE AGRI-FOOD SECTOR.

Big Data Analytics and Supercomputation. Machine learning techniques for data analysis (Python Scikit-Learn, Scipy, Notebooks Jupyter). Analysis of streaming data. Distributed computation (Apache Spark). 6 ECTS

MODULE 9

COGNITIVE TECHNIQUES AND BLOCKCHAIN.

The concepts and application of cognitive techniques and blockchain technology in the agri-food chain and the rural world.
6 ECTS

MODULE 10

DECISION SUPPORT SYSTEMS (DSS).

Big data analytics and supercomputation for the agri-food sector. Technological Surveillance and Competitive Intelligence. Optimization techniques. Decision Support Systems (DSS). ERP concepts and tools. Design and development of DSS and Dashboards. DSS applied to the agricultural value chain. 5 ECTS

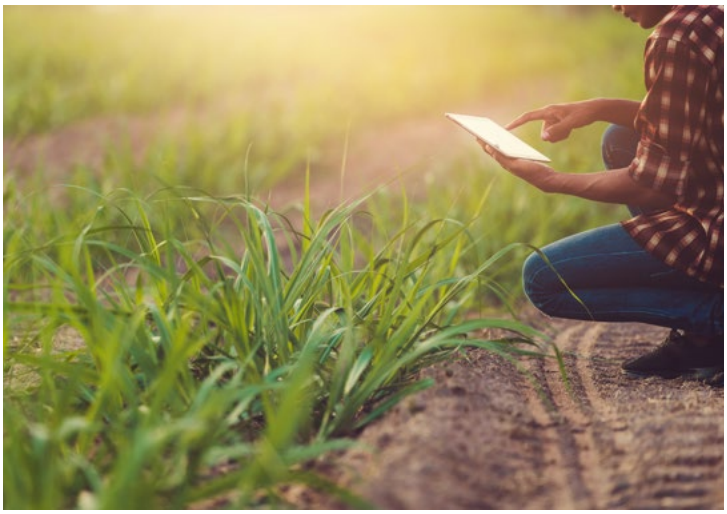
MODULE 11

INTERNSHIPS IN COMPANIES.

The internships in companies will preferably take place between the months of July and December, or during the academic year, combining them with lessons at university in dual modality. The academic agreements signed with the companies that charge the students reflect the specific skills and tasks that they will carry out during their stay and that are linked to the contents and skills of the Master. Students will be able to benefit from all calls for scholarships from the University of Córdoba to carry out paid internships in companies. 4 ECTS

MODULE 12

MASTER'S THESIS.



The student must carry out, present and defend an original exercise that synthesizes the skills acquired in the teachings, and/or reveals adequate knowledge and ability to develop and apply new digital technologies to solve problems in the agronomic, Agrifood or forestry. They will have one or two Directors of the Masters Thesis (at least one professor of the Masters and will be publicly defended in a commission of three members, one of whom will be an external expert to the masters degree). The completion of the Masters Thesis will be promoted to resolve REAL CASES of interest to companies and of an INNOVATIVE nature. The entrepreneurial spirit will be encouraged and the development of SPIN-OFF/STARTUP arising from the Master itself will be promoted. 14 ECTS









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